MUSEUM DEVELOPMENT EAST MIDLANDS

GREENER MUSEUMS CASE STUDY
CASTLE DONINGTON MUSEUM

WHY GREENER MUSEUMS?

Castle Donington Museum is an accredited, award winning local history museum run entirely by volunteers. It is located in a listed two storey barn attached to a 17th century farmhouse and operates on a long term lease bequeathed to the museum. It occupies two front rooms and a back kitchen in the main house, in addition to both storeys of the barn.

This historic building is not particularly spacious or well insulated and can have naturally high humidity levels arising from the original building design. Members describe it as possibly the most unsuitable building for a museum and the trust spends 20% of annual turnover trying to maintain temperatures and relative humidity at acceptable levels for collections, volunteers and visitors.

They joined the **Greener Museums** programme to gain a deeper understanding of the issues at play and to identify practical, affordable and effective improvements.

REVELATIONS OF THE PROCESS

The **Greener Museums** review highlighted that 70% of the museum's energy bill related to storage heating and 17% to dehumidification, however these appliances performed poorly, failing to meet requirements across much of the year. Replacing these with models that can be programmed to meet a target temperature and Relative Humidity (RH) would improve efficiency and performance. However, such measures do not address factors influencing the demand for heating and dehumidification, such as the building envelope.

At Castle Donington Museum, the building envelope buffers and regulates internal moisture levels through its breathable materials and design features. Understanding how to utilise and maintain such features and characteristics is key to reducing the demand on heaters and dehumidifiers. These include keeping the basement ventilations grills clear on either side of the building to promote cross-ventilation, allowing all surfaces to breathe, ensuring all drainage channels are kept in good working order and maintaining the building envelope to reduce erosion and excessive moisture ingress through the structure.

The in-use strategy for the museum is also influential on internal RH levels, particularly as occupation of the museum is intermittent (2-3 days a week) increasing the risk of moisture from people, kettles and cleaning becoming trapped in this small building. Measures can be taken to reduce and disperse sources of moisture, for example, through natural ventilation and minimising moisture generating activities in sensitive areas.

Temperature and RH data collection is restricted to twice a week or when the volunteers are on site, limiting ability to identify patterns, issues and the impact of various factors on RH and temperature. The use of an automated data logging system that could be accessed remotely and send text message alerts when thresholds are breached would be more practical and effective.

> **"It was an amazing report, we were really pleased to get it - it explained everything."**
>
> **Delia Smith, Curator**

OUTCOMES AND PLANS

> **"We are using this Greener Museums report as a sort of blueprint for our forward plan…because we see that as safeguarding the future of the museum building and the artefacts"**
>
> **Chris Hill, Chairman**

Following issue of the **Greener Museums** report, members of the museum met with the programme advisor to discuss recommendations and draw up a prioritised action plan.

The first steps were to identify the costs of a building condition survey that would identify essential repairs and ongoing maintenance required to minimise moisture loading (amongst other issues) on the building.

To enable deeper understanding of the temperature and RH dynamics in the building and display cases, the museum has invested in an automated data logging system (assisted by the MDEM small grant) providing frequent data collection, remote access and text alerts.

Exhibition room at Castle Donington Museum

Once a more comprehensive baseline has been established for the buildings, this data will be used to help specify new electrical space heaters and dehumidifiers with superior efficiency ratings and controls that will help to stabilise the environment.

Faced with limited collection storage and handling space, the museum is also actively seeking to create a satellite store and workspace in a local community centre that will be more accessible and comfortable for volunteers to work in.

Other recommendations relating to lighting, insulation, portable heaters and air tightness will also be progressed by the museum over an estimated five year period.

Due to the underspecified capacity of the existing heaters, it is possible the financial saving to be made by the museum will be small, however a vastly improved environment for volunteers, visitors and artefacts is an essential outcome for the museum.

Investment in these improved technologies, combined with a greater understanding of the building's design and dynamics are required to provide more effective and efficient time-saving solutions for Castle Donington Museum.

Annual energy costs: £1,530 (2015/16)
Savings identified: 5% (+)
Annual CO_2 savings: 313kg

To hear the full audio case study by members of the National Justice Museum please go to www.mdem.org.uk/case-studies/greener-museums-case-studies

ABOUT THE GREENER MUSEUMS PROGRAMME

In 2016/17 museums joined the **MDEM Greener Museums** programme to access specialist advice and support from a dedicated Advisor. Museums received an on-site review to identify opportunities to become greener and more resilient, followed by a report and action planning development meeting. An MDEM small grant was also made available to museums on the programme.

Greener Museums is part of the wider Museum Development Programme run by MDEM and funded by the Arts Council England. To find out more please go to: **www.mdem.org.uk/green-museums-2016**